

Jack pine

(*Pinus banksiana*)



Since 1983, both the **volume and rate of growth of jack pine have decreased** significantly. The number of seedlings and saplings, however, has increased by 60% in the last ten years.

Jack pine has a **much higher ratio of mortality to growth** than other species in the state. For instance, jack pine accounts for about 1.5% of all volume and growth of trees in Wisconsin, but 3% of total mortality.

Jack pine is **an important timber species**, accounting for 4.5% of roundwood product in 2003. The total biomass of jack pine is only 1.1% of the total for all species and the density of jack pine wood is fairly low.

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“How has the jack pine resource changed?”
Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of jack pine in 2008 was about 281 million cft or 1.3% of total volume in the state (Chart 1). This represents a decrease of 48% since 1983 and 26% since 1996.

Volume in growing stock trees is decreasing in all size classes but disproportionately in [pole](#) and [sawtimber](#) trees (Chart 2).

Although volume has decreased, the number of saplings has increased over 30% since 1996 (Chart 3). This suggests that jack pine volume may rebound in the future. Less than one quarter of all jack pine is planted.

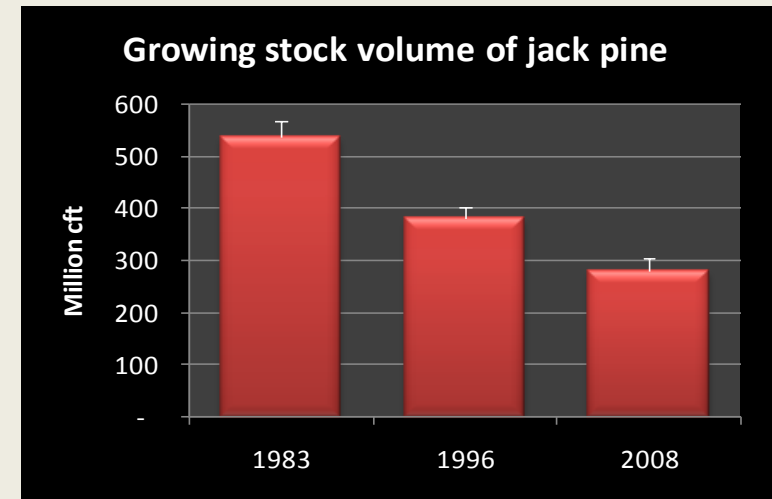


Chart 1. Growing stock volume (million cubic feet) by inventory year.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

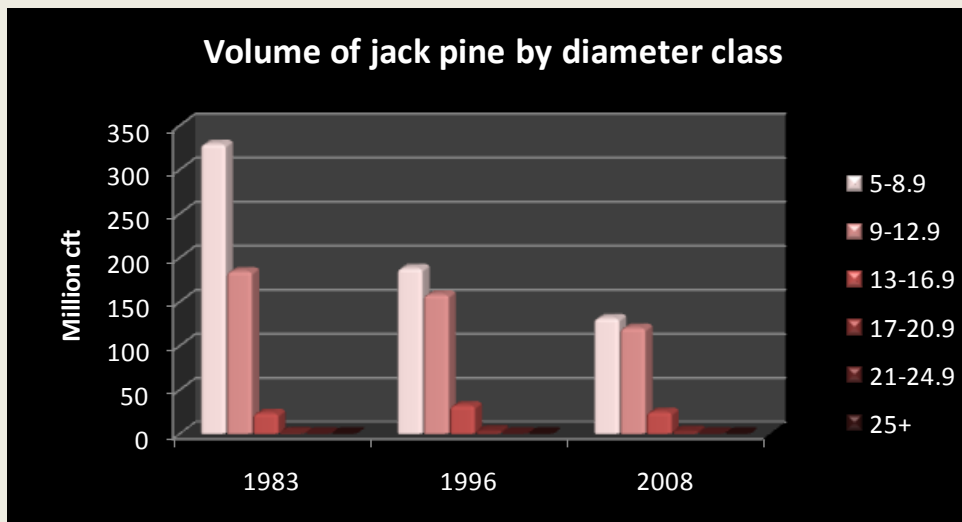


Chart 2. Growing stock volume (trees over 5 inches dbh) in million cubic feet in 1983, 1996, and 2008.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

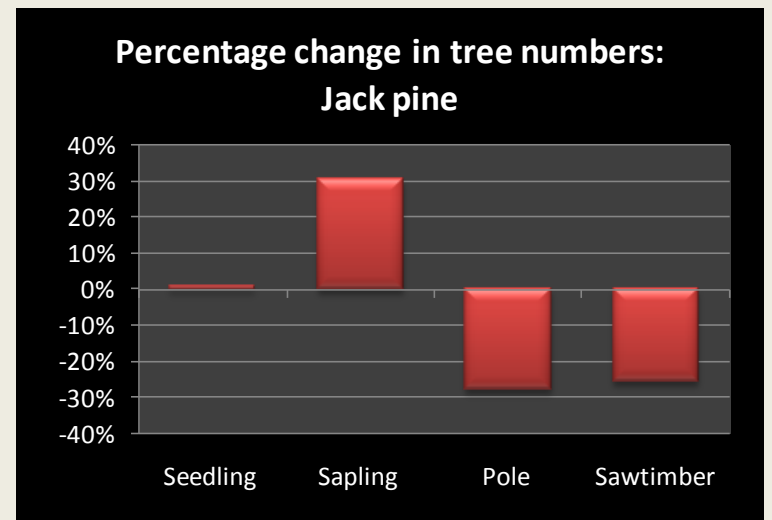
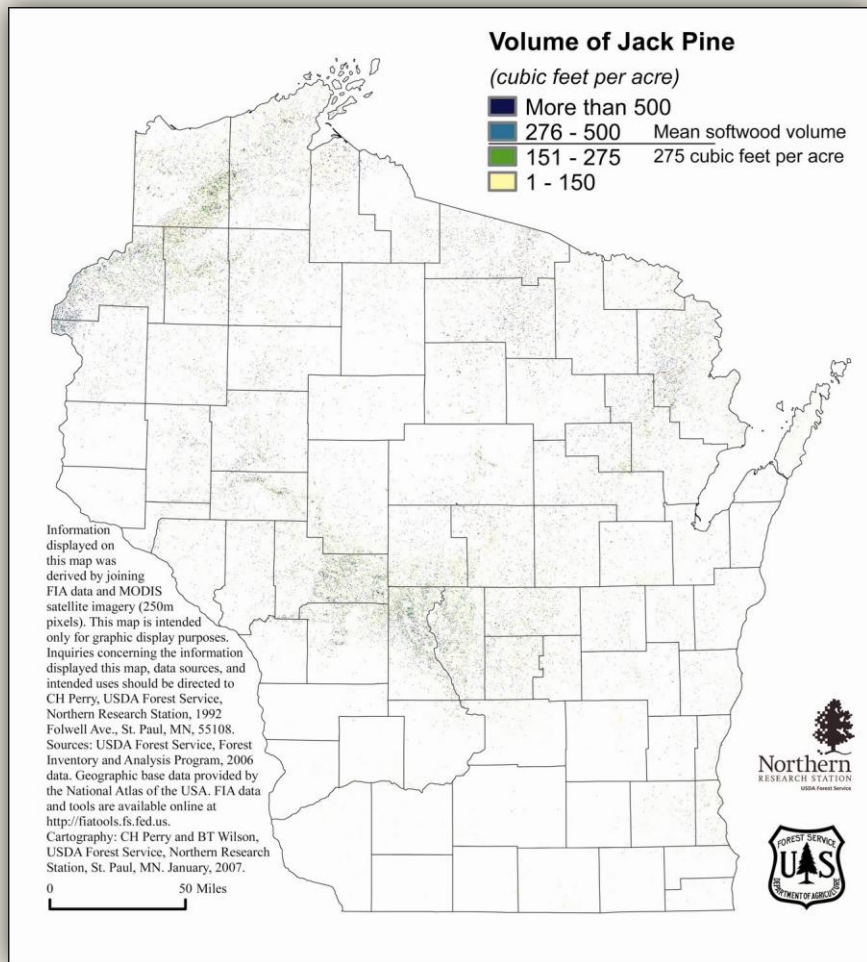


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2008.
 Source: USDA Forest Inventory and Analysis data 1996, and 2008.

"Where does jack pine grow in Wisconsin?"

Growing stock volume by region with map



About $\frac{3}{4}$ of jack pine volume is found in the sandy soils of northwest and central Wisconsin with lesser amounts in the northeast (Table 1).

The vast majority of jack pine volume occurs on pine [forest types](#) with lesser amounts on oak/pine and oak/hickory types.

Table 1. Growing stock volume (million cft) by species and region of the state.

Species	Central	North east	North west	South east	South west	Total
Jack pine	117	63	96	1	5	281
Percent of total	42%	22%	34%	0%	2%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2008 data

Additional tables: Volume by county in 2008 ([pdf](#); [Excel](#))



"How fast is jack pine growing?"
Average annual net growth by region and year

Average annual net growth of jack pine has decreased by 74% since 1983 to 6.2 million cft/year currently (Chart 4). This represents about 1.1% of total volume growth in Wisconsin. Growth rates have decreased 39% since 1996.

Table 2. Average annual net growth (million cft/year) of growing stock and the ratio of growth to volume by region of the state.

Region	Net growth	Percent of Total	Ratio of growth to volume
Central	2.4	40%	2.1%
Northeast	0.9	14%	1.4%
Northwest	2.8	45%	2.9%
Southeast	0.0	0%	0.1%
Southwest	0.1	1%	1.1%
Statewide	6.2	100%	2.2%

Source: USDA Forest Inventory and Analysis 2008

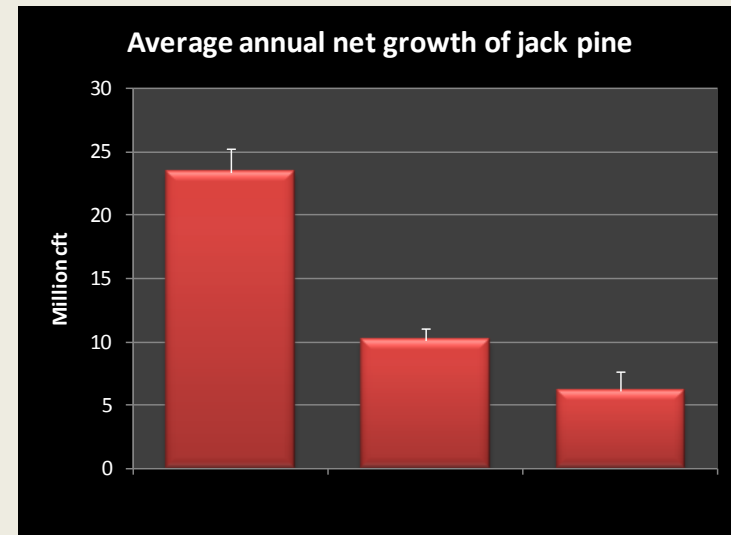


Chart 4. Average annual net growth (million cubic feet).
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2008

Northwest Wisconsin has the highest percentage of volume growth in jack pine, 45%, and the highest ratio of growth to volume in the state (Table 2).

The statewide ratio for jack pine is 2.2%, lower than the average of 2.8% for all species.

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How healthy is jack pine in Wisconsin?"

Average annual mortality: 1983, 1996, and 2008

Average annual mortality of jack pine, about 6.8 million cft per year, more than doubled between 1983 and 1996 but has fallen 22% since 1996 (estimates with high sampling error).

The ratio of mortality to gross growth is 52% for jack pine (Table 3), much higher than the statewide average of 26%. Whereas jack pine accounts for 1% of total growing stock volume in the state, this species makes up 3.3% of total mortality.

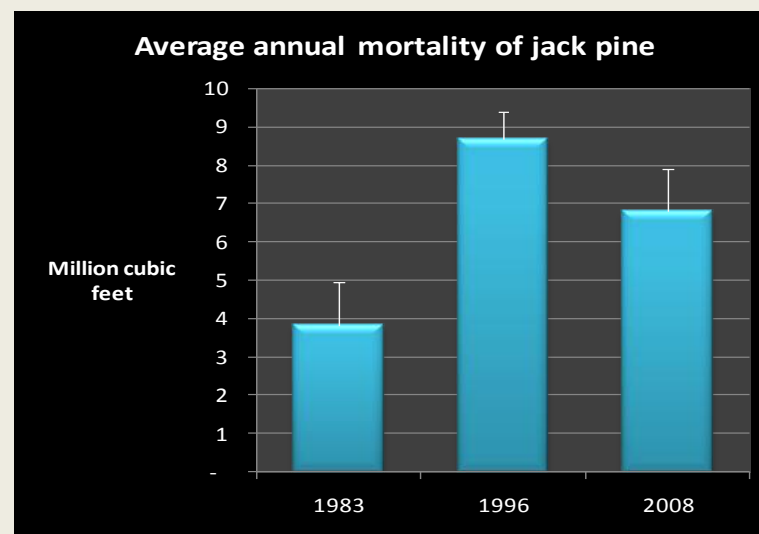


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2008

Table 3. Mortality, gross growth (excluding mortality) and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Jack Pine	6,786,769	12,963,259	52%

Source: USDA Forest Inventory & Analysis data: 2008

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How much jack pine do we harvest?"

Roundwood production by product and year

In 2003, jack pine accounted for 19 million cft or 4.6% of Wisconsin's total [roundwood](#) production. Over 70% was used for pulpwood (Chart 6).

From 2003 to 2006, pulpwood production had decreased 7.7 million cft or 57%.

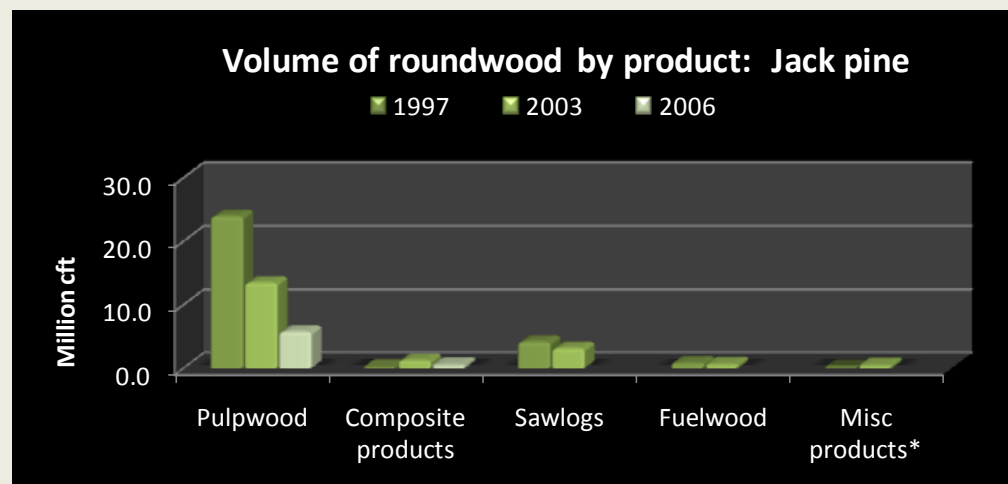


Chart 6. Volume of roundwood products. The most recent numbers for pulpwood and composite products are from 2006 and the most recent numbers for sawlogs, fuelwood and miscellaneous products are from 2003 (Ron Piva).
* Miscellaneous products include poles, posts, pilings and veneer.

Source: Timber Products Output Mapmaker, http://ncrs2.fs.fed.us/4801/fiadb/rpa_tpo/wc_rpa_tpo.ASP

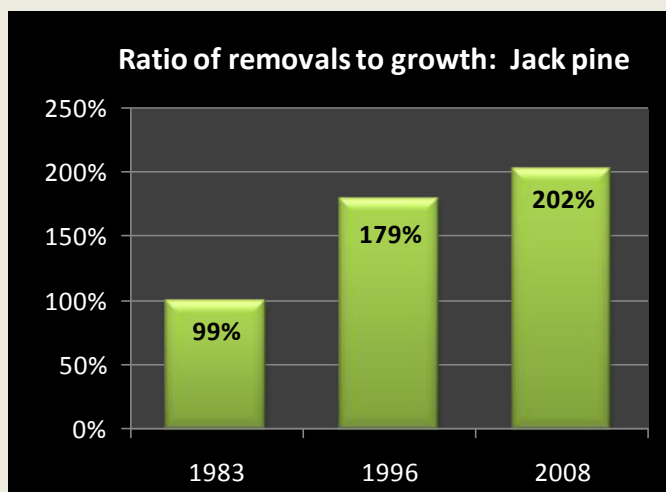


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008.

The ratio of removals to growth has more than doubled since 1983 and now stands at 202%, much higher than the average of 56% for all species and the highest for any commercial species in the state (Chart 7).

A ratio over 200% means that we are harvesting twice as much wood as is being replaced by growth (minus mortality). This is due to both very high removals and very high mortality.

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How much is jack pine selling for?"

Prices for cordwood & sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR 46.

Prices for jack pine stumpage and delivered pulpwood, as reported in the Timber Mart North (Chart 8), have decreased since 2000.

Average weighted prices for cordwood (Table 4), as reported in NR46, have decreased since 2006 and have varied considerably for logs.

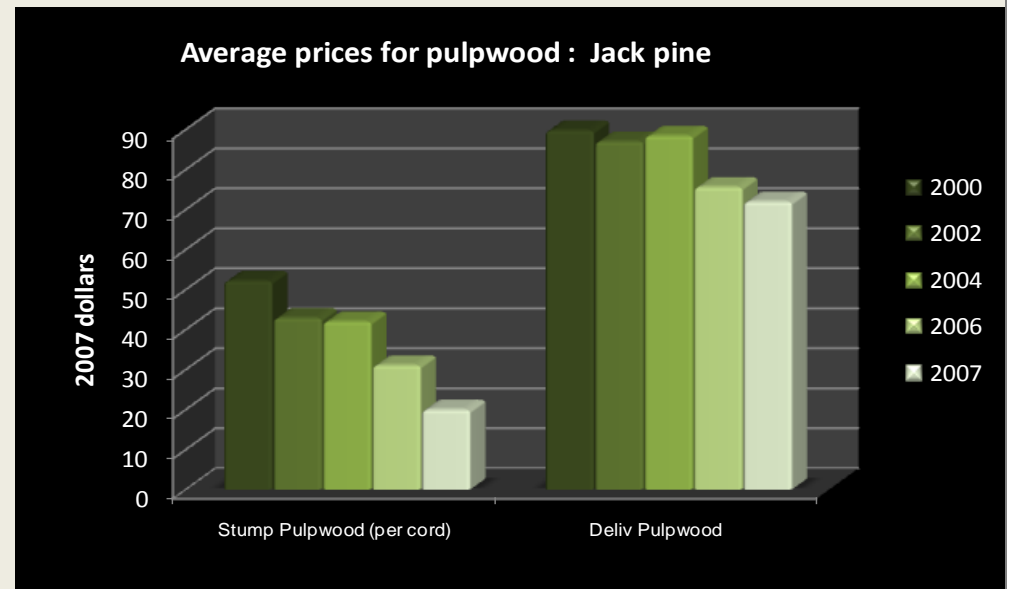


Chart 8. Average prices for cordwood and sawtimber (2007).

Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2009 dollars) by year for Wisconsin.

Product	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average for all softwoods
Cordwood (per cord)	\$52	\$61	\$57	\$57	\$55	\$60	\$71	\$46	\$32	\$31	\$23
Logs (per MBF)	\$45	\$122	\$53	\$62	\$71	\$150	NA	\$17	\$78	\$59	\$76

Source: Wisconsin Administrative Code Chapter NR46, 2000 to 2009



"How much jack pine biomass do we have?"

Oven-dry tons by region of the state

There were 6.3 million oven-dry tons (ODT) of jack pine biomass in 2008, a decrease of 1.6 million ODT or 21%, from 1996. This species represents only 1.1% of all live biomass statewide. As with volume, most jack pine biomass is located in central and northwest Wisconsin (Chart 9).

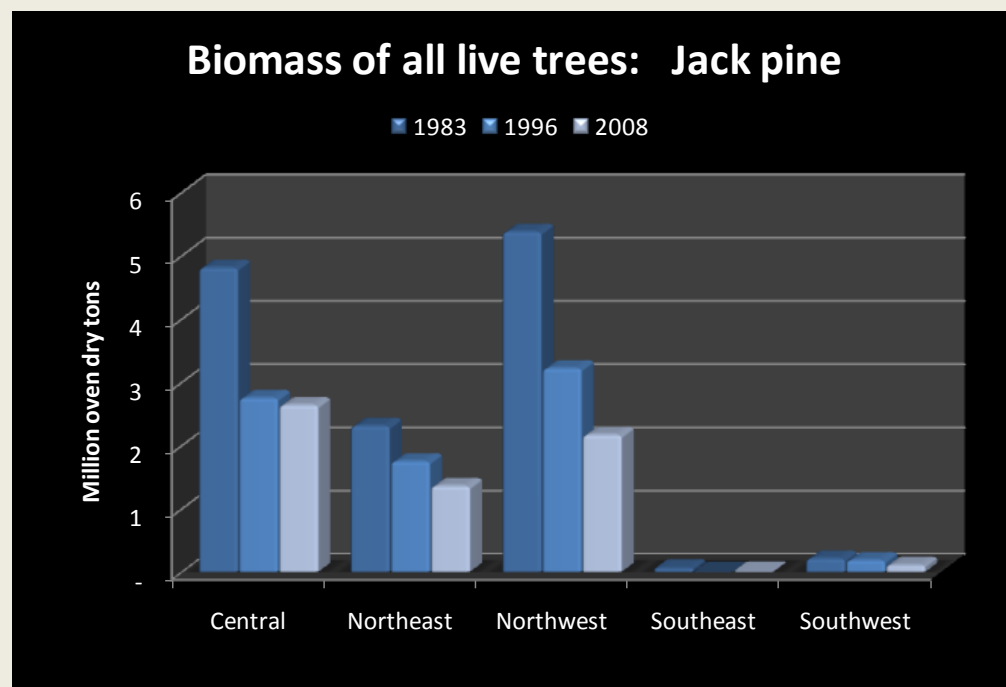


Chart 9. Biomass (million oven-dry tons) by year and region.

Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008

The density of jack pine wood is fairly low with a ratio of biomass to volume of 36.7 oven-dry lbs. per cubic foot (ODP/cft). The average for all softwoods is about 34.3 ODP/cft and for all species is 46.8 ODP/cft. Approximately, 80% of all jack pine biomass is located in the main stem and 15% in the branches.

The low amount of jack pine as well as the low density of its wood may make it a low value species for biomass production.

Additional tables: Biomass by county in 2008 ([pdf](#); [Excel](#))